

Special Articles and Association Notes

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British Columbia Health Insurance Scheme

The following are extracts from the Bulletin of the Vancouver Medical Association—

"A Brief Analysis of the Tentative Plan Suggested by the Health Insurance Committee of the College of Physicians and Surgeons of British Columbia."

Exemptions.—The actual list of exemptions contains some conditions that, we feel, are bound to lead to conflict, e.g., postpartum conditions. Here the possibility of cancer in later life, and of other conditions arising, is going to lead to much confusion and discussion.

The diabetic, too, cannot obtain insulin, or the pernicious anæmia patient liver extract, as part of the free benefits.

The Method of Payment for Medical Services

It is in this part of the plan that the chief differences arise between the Commission and ourselves.

The charge of \$1.00 or \$1.50 for first house calls in any one illness is an innovation, we feel, that is not satisfactory. In the first place, the insured

will resent it greatly, and, we cannot but feel, with considerable justice. This is in direct contradiction to the principle of a complete service.

In the second place, there can be no doubt that it will be very difficult to collect— —

The method of payment, by capitation fee for the general practitioner, by payment from a fixed pool of taxed bills for the specialist.

The capitation fee method of payment is, we believe, a bad method, based on a wrong principle. The medical profession of Canada has always opposed it. We cannot here go into detail—but we again record our settled opinion that, as has always been our rule, definite service should be paid for on the basis of a definite schedule of fees, as is done by the Workmen's Compensation Board and in private practice. We still adhere to this principle.

Next, as regards payment from a fixed pool. This is a most pernicious principle, as we believe. The specialist does the work, renders his bill according to the scale of fees adopted by the B. C. Medical Association, and then has no means of knowing what percentage of his bill he will receive—since this depends on the ratio of the total amount of bills sent in to the fixed pool. We have no hesitation whatever in saying that this is entirely wrong. No man in any other walk of life would undertake to do work without knowing how much he could be sure of receiving—no business man would sign any such contract as this.

We know, too, that under any scheme of Health Insurance work has always greatly increased—in fact, it is evident from the Preamble to the original Brief of Dr. G. M. Weir that a very great increase will be expected from us.

Mileage.—We must further point out that the Commission has definitely declined to make any allowance for mileage, which must be collected by arrangement between the doctor and the patient. This is grossly unfair to the latter, and in fact will, we believe, make service under this scheme impossible in large areas of the Province.

From the standpoint of the Insured.

The Committee feels, and so informed the Commission, that it cannot consider this Act adequate from the public standpoint.

In the first place, it omits all the very people in the community who most need medical care—the indigent, those on relief, domestic servants, old-age and mothers' pensioners, casual and part-time labourers, and those earning less than ten dollars a week.

No provision is made for these at all, and the medical profession must still continue to carry this whole load of unpaid work, both in and out

of the hospital, without any compensation whatever.

After we had made many requests for action along this line—which, in our belief, was promised again and again, with no result—we finally obtained a statement from Premier Pattullo that the question of the indigent would be taken up and settled *after the Health Act was in force*. We frankly cannot accept this as of any value at all.

Secondly, the service given is not complete. The list of exemptions is the first break—and denies essential treatment to certain groups, e.g., the diabetic, the patient with pernicious anæmia, and to certain women who need surgical attention.

The charges for first calls are an additional tax to the man with a family, and may constitute quite a burden.

Hospitalisation.—This is, in our opinion, a very serious matter. Every hospital in British Columbia, almost without exception, is now filled to capacity. In such centres as Vancouver there is already a grave shortage, of some 500 to 600 beds. It is quite certain that when Health Insurance comes in there will be a great increase in hospitalisation—far more than the Commission will allow will be the case. Further, the experience of Australia and other places shews a great increase in hospital days for each patient under free plans.

Free hospitalisation is promised, and is one of the chief elements in the plan.

We do not believe that there is any possibility of giving it under present conditions.

The medical profession is not opposed, as we assured the Commission, to Health Insurance. Rather, it is in favour of it, almost unanimously; but there are certain principles which we feel must be observed, amongst them a fair and adequate remuneration for the medical man, on scales which conform with the findings of all the major surveys. We believe, too, that payment should be by a definite fee for definite work, not by capitation fee. That service given should be complete and inclusive, without exemptions, if a complete scheme is to be inaugurated—and if this is to be the case, sufficient money should be provided. We feel that if there is not enough money to provide a complete scheme, under terms fair to all concerned, then a partial scheme should be installed at first, under which we could feel our way safely and without injustice to any, towards a more ample scheme later. We oppose strongly the idea that the medical profession should take all the risk, but we reiterate our complete willingness to explore all avenues towards the establishment of a fair and practicable scheme, and will prepare and suggest alternative plans to that end, or consider honestly any that may be brought forward. But, as this plan stands at present, we cannot feel that it is satisfactory, or recommend it to the general profession.

Professor Boyd's New Book

An Introduction to Medical Science

William Boyd, M.D., M.R.C.P. (Edin.), F.R.C.P. (Lond.),
Dipl. Psych., F.R.S. (Canada), Professor of Pathology
in the University of Manitoba, Pathologist to the
Winnipeg General Hospital, Winnipeg, Canada
Lea and Febiger.

Professor Boyd had just published a small text book "An Introduction to Medical Science."

The book was intended primarily as an introduction to medical science for pupil nurses, and for this purpose it can be unreservedly recommended. It can, also, be recommended to students who are beginning their medical course and have finished their pre-medical work. It will serve as a general introduction to medical science giving the student a comprehensive view of the knowledge covered by a medical course at a time when he is liable to be hopelessly lost in the maze of detailed technical knowledge which he is expected to acquire in the first year of his course. It will be of interest to many lay people who are interested in the progress of medical science.

The first section reviews the nature and cause of disease generally and corresponds to the general pathology of the larger medical text books. It describes diseases due to bacteria, animal parasites, tumours, etc. The second half of the book deals with special regions, heart, lungs, nervous system, and so on. Thus the book follows in a general way the usual form of a text book of Pathology. It is, however, written in very simple manner and can be understood by anyone with a minimum training in scientific subjects such as is given in a high school. Although it deals with the subject in a concise fashion it covers the recent advances in the various departments of medical science, for example, the summary of the diseases of ductless glands and the description of the various internal secretions is in keeping with the most recent work. There is a chapter on "The Prevention of Diseases" which naturally deals mainly with infectious diseases. The last chapter on "The Nurse and the Laboratory" instructs the nurse in the methods of collecting material to be sent to the laboratory and also gives her some understanding of the meaning of the reports returned from the laboratory.

The material is well arranged and the type and headings are such as to make reading extremely easy. There are an adequate number of simple illustrations, many of which were made especially for this text.

Finally, the book cannot be reviewed without referring to the style in which it is written. One of the features of all Professor Boyd's text books has been the excellence of his literary style. This text is written in a way that makes the reading of it a pleasure. It is an outstanding example of modern English prose.

Medical men should have no hesitation in recommending "An Introduction to Medical Science" as a standard text book for training schools for nurses.

DR. ROBERT JAMES CAMPBELL

Dr. Robert James Campbell, aged 75, died almost literally in harness at his home, 426 Charles street, Winnipeg, on January 29th. On the previous day he had made his rounds and seemed his usual cheerful self. He graduated from the Manitoba Medical College in 1891, and before coming to Winnipeg practised in Rapid City, Carnduff, Sask., and Boissevain, where he was a partner of the late Dr. Lawrence Shaffner, former M.P. and Senator. Dr. Campbell practised in Winnipeg for the past fifteen years. He was interested for many years in the work of the College of Physicians and Surgeons, was President in 1926-27, and at the time of his death was Chairman of the Discipline Committee of the College. St. John's Cathedral, in which he served as vestryman, was another of his interests. He was a doctor of the old school with all that that implies of integrity and conscientiousness.

DR. DAVID ALEXANDER STEWART

Dr. David Alexander Stewart, Superintendent of Manitoba Sanatorium, Ninette, died at the Winnipeg General Hospital after a long illness on February 16th, aged 63.

His father, born in Cromar, Aberdeenshire, settled at Fletcher, Keith County, Ontario, where David was born. The lad was educated at Chatham, and, when the family moved to Manitoba, he took his Arts course at Manitoba College, graduating in 1899. Theology then claimed him, but while on a mission field in Frank, Alberta, his voice failed, and the example of the doctor in caring for the wounded after the disastrous rock slide induced him to enter Medicine. In 1906 he graduated from Manitoba Medical College, having paid his way by working as a reporter with the *Winnipeg Free Press*. For two years he served as an interne at the Winnipeg General Hospital, then became Field Secretary of the Anti Tuberculosis League of Manitoba, traversing the province to spread the gospel of the curability of tuberculosis and to raise funds for a sanatorium. His fiery zeal led to a breakdown, when it was discovered that his lungs were affected. A year at Trudeau Sanatorium, Saranac, N.Y., and as resident in a Connecticut institution gave him first hand knowledge of sanatorium life and so renewed him that he was able to work with his former vigour. Pelican Lake near Ninette was chosen as the site of the new Manitoba Sanatorium, and the first buildings were erected in 1910 with sixty beds available for patients.

When the quarter century anniversary of the Sanatorium was observed in 1935, Premier John Bracken and other speakers reviewed Dr. Stewart's work. At Ninette there are 250 beds; a Central Tuberculosis Clinic has been opened at Winnipeg; travelling clinics go out into the highways and byways of the province examining tuberculosis suspects and contacts; the death rate from the disease had been cut to one-fifth, and the menace to children from that source reduced to one-tenth.

Remarkable as were Dr. Stewart's activities in this connection, they did not limit the range of his interests, nor absorb the whole of his dynamic energy. Medical history, and the history of the fur traders in the Canadian North West found him an authority, and one of his special hobbies was to trace the sites of the forts of the Hudson's Bay, North-West and XYZ Companies along the Assiniboine and Souris rivers. For two years he was President of the Manitoba Historical and Scientific Society, and he was also a member of the Historic Sites Commission. His enthusiasm for education, beginning first with the Sanatorium school and extending to the University and to adult education, led to an honorary LL.D. degree Manitoba, the Honorary Presidency of the Manitoba Adult Education Committee and to his election by the Alumni as a Governor of the University. In 1928 he was president of the Manitoba Medical Association, and in 1935 he was appointed Chairman of the Committee on Credentials and Ethics of the Canadian Medical Association, an office which he held up till his death. In this capacity he wrote a new Code, agreeable to present day conditions and graced with quotations from the great medical classics. It was characteristic of his devotion to duty that as late as four days before his death he supervised a letter to be sent to members of the Committee and made marginal notes in his own handwriting.

His published work consisted of numerous papers reflecting the wide range of his interests, and marked with vigour and charm of style. He preached a wholesome and heartening philosophy of the sick room.

Though he received no instruction in art, he did creditable work in dry paint and water colors. At a recent exhibition of the Winnipeg Sketch Club four of his pictures were shown, one of them a view from his hospital window of the city atmosphere at 40 degrees below zero.

From its inception the Sanatorium was linked with the Medical School for the teaching of physical diagnosis. Not the least of Stewart's work was the training of young doctors in tuberculosis, and many who now occupy prominent posts will admit their obligation to his inspiration.

In 1915 he married Ida K. Bradshaw, a graduate of the Winnipeg General Hospital School of Nursing, and one of the earliest Social Service nurses in Canada. Later she became widely known through her writings in the cause of peace. Delicate in health for long years, she moved to Winnipeg last autumn to be near her husband, but the change was too great for her strength, and she succumbed in November, only a few weeks before him.

*"They were lovely and pleasant in their lives,
And in death they were not divided."*

An only son, David Bradshaw Stewart, is a student in Medicine.

Dr. Stewart exhibited the "angelic conjunction" of physician and priest. All his work was permeated with a deep moral earnestness and he lived "as ever in the great taskmaster's eye."

Department of Health and Public Welfare

IN APPRECIATION

With the passing of Dr. Stewart, the Department of Health and Public Welfare has lost one of its staunchest supporters, in fact has lost one of those who had a great deal to do with having Public Health activities in our Province put on a firm basis.

Dr. Stewart was a member of the Provincial Board of Health for the ten year period from 1924 to 1934, and in 1927 was a member of a Committee of the Board charged with making a survey of health conditions in Manitoba.

Dr. Stewart was also Chairman of a Health Committee appointed by the Manitoba Medical Association in 1926. This Committee reported to the annual meeting in September, 1927, and presented several regulations on Public Health which were transmitted by the Association to the newly-appointed Minister of Health and Public Welfare, Honourable Dr. E. W. Montgomery. It is gratifying to note that a lot of the resolutions have been already implemented.

Dr. Stewart always stood ready to assist the Department whenever requested to do so. He was a strong advocate of all accepted health measures and the Sanatorium and travelling Clinic have been the greatest forces for health education in the Province.

His span of service has ceased. He leaves us a goal to strive for. Our duty is clear—to follow the road he has pointed out and to give our service to the utmost to those who need it.

NEWS ITEMS

THE DIET OF THE NORMAL PERSON: The following is an article written by Jacob Buckstein, and published in the December issue of "Preventive Medicine" which the Department believes will prove of interest to the practising physician as well as of benefit to the lay person:—

"So much attention has been devoted to a consideration of diet in disease, that the subject of diet for the individual who is essentially normal is not sufficiently emphasized.

It is taken for granted that the patient who comes to us seeking help and advice is necessarily on a well balanced diet. Perhaps the difficulty with some of our patients, who on careful examination show no obvious evidence of organic disease, and whose condition is sometimes regarded as functional may be found in a diet that is improperly balanced as far as essential constituents are concerned.

Not enough inquiry is ordinarily made to determine whether the patient is obtaining all his dietary essentials, and what relation a possible lack of important food factors may have to his symptoms of malaise, irritability, easy fatigue, and 'run down' condition.

The close relationship of food and physical development is shown in many interesting ways. We find for example that the Hindus and most of the Japanese, Chinese and Malays rarely grow tall. Their diet, consisting mainly of rice, does not supply that optimum of protein essential to maximal growth. The Manchus,

however, who have a more liberal amount of protein in their diet, do grow much taller.

It has been found that Japanese children have practically no milk, cheese or butter in their diet. They are ordinarily stunted in growth. That it is not an unmodifiable characteristic of the race is shown by the reports of the Japanese children born in the United States. On a diet containing better protein, more calcium and fat-soluble vitamin of milk, they grow taller and heavier. This is also true of the children of the foreign born. With better nutrition they grow considerably taller than their parents, the difference in some cases being four to five inches. Correlated with this is the fact that intellectual superiority is influenced by physical well-being. Those with poor nutrition are frequently handicapped mentally. Such children lack energy, are inattentive and slow in comprehension and often stupid. Moreover, their resistance to infection may be diminished.

What are the important food groups that enter into the normal well balanced diet?

The Protein Group of Foods

In this class milk is of prime importance. It is of this food that Dr. McCollum wrote 'Milk is the most satisfactory single article of diet that is suitable for consumption by man.' Professor Lusk stated, 'Milk is our greatest protective food and its use must be increased.'

Still another authority writes that 'carefully controlled experiments with diets containing systematically varied amounts of milk, lead to the conclusion that one quart of milk per child per day is the amount required for optimum storage of calcium, and presumably therefore for optimum development of teeth and bones.'

Corry Mann as a result of his four years of dietetic study in an English Institution wrote as follows: 'In practically every case it was noted that children receiving milk showed, even where there was obviously poor maternal care, that sleekness peculiar to a well nourished animal. Their hair had a glossy and bright appearance. Their nails were smooth, resilient and looked as if polished. General alertness was common to all of the children fed on milk. . . . It was gathered from teachers and janitors that the children receiving milk were much more alert and very much more boisterous and difficult to control than the others. The latter fact was only too evident when they were waiting in small groups to be weighed. The initial improvement continued over the second year.'

Professor Sherman has shown that the addition of milk to the diet of animals prolongs their life.

The reason for the great nutritive value of milk is that it contains the richest assortment of the various dietetic factors in a single food. It should therefore form an important part of the diet, particularly of the growing child. From the standpoint of the construction of animal tissue, the great value of milk lies in the excellent quality of its protein, which is the best that nature supplies us with, and superior to the protein found in vegetables.

Milk contains the necessary minerals so important for health and growth except that the amount of iron it contains is insufficient. The iron must therefore be obtained from other sources in order to make up for this deficiency, such as fruits, vegetables, whole grain cereals, eggs and meats. Milk is particularly valuable for its high content of calcium and phosphorus which are essential for the construction of bone. About one gram of calcium a day is important for the growing child. This can best be supplied by a

quart of milk a day. The dictum 'one quart of milk a day' has a very definite scientific basis. Even in the case of the adult who has achieved his maximum physical growth, at least a pint of milk may be advantageously included in the diet.

For those to whom milk is a 'melancholy' drink, it may be served in different ways. It may be incorporated with cereals or fruit, in beverages such as tea, cocoa or coffee or in soups or with vegetables. Custards, puddings, souffles or ice cream are other ways in which milk may be taken more agreeably. Cheese may be substituted. Buttermilk, fermented milk or milk with vichy may be preferred.

Meat, poultry and fish are other forms of protein of excellent biologic value. Meat and liver are among our best sources of iron. Meat is deficient in calcium and this important mineral must be obtained from other sources such as milk and green leafy vegetables. Fish is superior to meat in vitamin value and many of the fish oils form our best sources of vitamin D. Oysters, clams and lobsters are rich in iodine. A daily serving of meat, poultry or fish should be included in the normal well balanced diet.

Another highly valuable source of animal protein is the egg. The great value of the egg lies in the fact that in addition to the embryo it also contains material necessary for its growth into the full-fledged animal. It is therefore a complete food for developing animal life and is equally valuable for man. In addition to its biologically excellent protein it is one of our best sources of vitamin D. One egg a day with a minimum of three to four eggs a week should be included in the diet of our patients.

Our most important protein foods are thus milk, cheese, meat, fish or poultry and eggs. The amount of protein desirable is ordinarily figured as between 10 to 15% of the total number of calories on a diet that meets the physical needs of the individual. This represents an approximate minimum of about 75 grams of protein a day. A glass of whole milk contains 8 grams of protein of high biologic value. An ordinary serving of meat or fish, weighing about one-third of a pound, contains approximately 25 grams of protein. One-half cup of cottage cheese contains 19 grams and one-inch cube of other types of cheese has 7 grams. One egg contains 6 grams of protein. Most of the protein in the normal diet should be obtained from these biologically excellent sources.

The Committee on Nutrition of the British Medical Association, in agreement with the best American opinion, has stated the importance of animal protein as follows: 'It is now usual to differentiate the protein foodstuffs into two classes. Proteins from animal sources are designated as first-class proteins, whilst those of vegetable origin are relegated to the second class. The first-class proteins, besides possessing a higher nutritional value than second-class proteins, are more nearly completely absorbed by the body.'

The Cereal Group

Cereals are primarily of value as a source of energy. While proteins are present, they are not biologically of such high quality as to be relied upon entirely for construction of the tissues of the human body. They must, therefore, be supplemented by such proteins as the casein of milk. If the whole grain is used with its coatings and it is not degerminated, then the cereal becomes an important source of mineral constituents, particularly iron, and of vitamin B.

Unfortunately the bran and germ removed by the roller-mill process contain practically all the important minerals—calcium, phosphorus, iron and iodine. Particularly significant is the loss of iron since milk which is an excellent source of calcium and phosphorus is also poor in iron. In addition there is a loss of important vitamins.

There is, however, no objection to white bread if milk, green leafy vegetables and citrus fruits are included in the diet in liberal amounts. While minerals and vitamins are destroyed in the milling process, what is left is still excellent food and one of our best sources of energy. However, where more than one-third of the energy requirement is obtained from cereal foods, it is a wise precaution to have our patients include some cereal in the unmilled state.

Fruits and Vegetables

It is important that our patients be instructed to include liberal servings of fruits and vegetables in their daily menu for the following three main reasons. They are rich in mineral matter. They are among our most important sources of vitamins. In addition they supply bulk which helps to regulate normal bowel function. In this group the green leafy vegetables, tomatoes, carrots, potatoes as well as the citrus fruits are of outstanding importance. The normal diet should contain at least two vegetables daily, one of these to be a liberal serving of the green leafy variety such as lettuce, spinach or cabbage. The tomato may be served several times a week. The vitamin C of which it is an excellent source is fortunately not materially impaired by heating or canning. Similarly the potato because of the amounts in which it is ordinarily eaten is a good source of vitamin C and it may in part replace cereals and bread.

Fruit should be included twice a day. Of outstanding importance are of course those of the citrus variety, orange and grapefruit. Over two centuries ago the importance of these foods in the prevention and cure of scurvy was recognized.

'Seek the cure of scurvy neither in the armamentarium of the physician nor in the apothecary shops. The druggist will be of as little aid to you as the art of the surgeon. On the other hand employ fresh vegetables, the juice of fresh antiscorbutic plants, oranges and lemons or the juice of those fruits preserved with sugar; in this way without other means you will be able to overcome this terrible disease.' This advice summarizes our knowledge of both treatment and prevention to this very day.

The importance of a sufficient amount of fresh fruit in the diet is shown by the experience of Professor Hopkins of Cambridge University. He noticed that school boys during the winter were unsatisfactory in their work. The diet contained only cooked foods and no greens. The condition was greatly improved by the addition of fresh fruit to the diet.

Our patients should be instructed to include at least one serving of a citrus fruit in the daily diet.

The Fatty Foods

Butter and cream are among the most important members of this group. They are rich in fuel value, palatable and except for fish oils and egg yolk are our best sources of vitamin A. They are readily incorporated in various ways in the preparation of many dishes. Buttering bread not only adds to its palatability but the fat leaves the stomach slowly and wards off hunger. It 'sticks to the ribs.'

It has been shown that Italian laborers on railway construction did not work up to par at eleven in the morning. Their work became more satisfactory when the amount of fat in the diet was increased. This also has been found to be true of Swedish and Canadian lumbermen, and of Welsh miners. By staving off premature hunger, they felt more satisfied, and their work in consequence was more effective. A minimum of one-half ounce of butter should be included in the daily diet of even those of our patients who are on a reducing diet.

Sweets

These supply in palatable form carbohydrates which are easily assimilated and available as a ready source

of energy. Because of their appeal to the taste the danger exists that refined sugars may supplant the desire for more highly valuable foods. Our patients should therefore be encouraged to satisfy their craving for sweets by eating the sugar containing fruits which in addition are important sources of minerals and vitamins. Candy should be placed at the end of the meal after the more important foods have been consumed.

The skeleton of the well balanced diet as recommended to our patients should therefore consist of the following foods:

1. At least a pint of milk a day either as such or incorporated in various ways as previously described.
2. One egg a day with a minimum of three to four eggs a week.
3. One serving of meat, fish or poultry a day.
4. At least two vegetables a day, one of these to be of the green leafy variety such as spinach or lettuce.
5. Two servings of fruit at least one to be of the citrus variety such as orange or grapefruit.
6. In addition butter, tomato and potato may be advantageously included.

The remainder of the diet may then be made up of cereals, bread and such other fruits and vegetables as the individual's taste may dictate. The consumption of refined sugar may be diminished if necessary or as candy placed at the end of the meal. Finally one may add the admonition of McCollum: 'Eat what you want, after you have eaten what you should.'

Added to this are, of course, those psychological factors which by appealing to the appetite increase the flow of the stomach and intestinal juices and prepare for these foods a favorable reception. The patient should be composed, the surroundings and the conversation pleasant, the food well served with an eye to attractive combinations of color in pleasing variety. The food should be chewed thoroughly and eaten slowly. While 'hunger makes the best sauce' these additional aids will coax the digestive machinery into serving us with maximum efficiency. Many years ago a great Hebrew sage wrote: 'Better is a morsel and quiet within, than a house full of feasting and strife.'

On the whole, it is a triumph of man's instinct, developed through natural selection, that it has shown itself to be a pretty reliable guide and except under conditions of unusual economic distress has saved him from serious nutritional disaster. Science has explained more rationally the reasons for this survival and clearly demonstrated some of the dangerous pitfalls that are to be avoided in order to assure the maximum physical and mental virility of the race.

It will teach us to beware of false gods who attempt to lead us away from many of the sound teachings of experience."

COMMUNICABLE DISEASES REPORTED

Urban and Rural - January, 1937.

Occurring in the Municipalities of:

Influenza: Total 511—Beausejour 500, Unorganized 4, St. Laurent 3, St. Vital 1, Portage City 1, Winnipeg 2.

Chickenpox: Total 250—Winnipeg 178, Dauphin Town 16, St. Boniface 14, Brandon 10, The Pas 9, Kildonan East 8, Lorne 5, St. James 3, Ericksdale 2, Roland 2, Kildonan West 1, Thompson 1, Unorganized 1.

Scarlet Fever: Total 220—Winnipeg 108, St. James 33, Kildonan East 15, Rockwood 10, Shell River 7, Kildonan West 5, Norfolk North 5, St. Boniface 4, St. Vital 4, Kildonan North 3, Thompson 3, Dauphin

Town 2, Morris Town 2, Rosser 2, Springfield 2, Westbourne 2, Charleswood 1, Fort Garry 1, Gilbert Plains 1, Gimli Town 1, Grandview Rural 1, Lac du Bonnet 1, Morden 1, Portage Rural 1, Roblin Town 1, Selkirk 1, St. Paul East 1, Transcona 1, Tuxedo 1.

Measles: Total 135—Winnipeg 27, Unorganized 26, Pipestone 19, Grandview Town 15, Oakland 12, Brandon 8, Lakeview 7, Norfolk South 4, Silver Creek 4, St. Boniface 4, Swan River Rural 2, St. Vital 2, Westbourne 2, Gladstone Town 2, Kildonan East 1.

Tuberculosis: Total 34—Winnipeg 7, Bifrost 4, Brandon 3, St. James 2, Unorganized 2, Beausejour 1, Brokenhead 1, Carman 1, Gladstone Town 1, Lawrence 1, Portage Rural 1, Rhineland 1, Selkirk 1, Springfield 1, Stanley 1, Swan River Town 1, St. Boniface 1, St. Andrews 1, St. Clements 1, St. Vital 1, Woodworth 1.

Mumps: Total 30—Winnipeg 14, Roblin Rural 6, Albert 4, Hanover 1, Norfolk North 1, Roblin Town 1, Selkirk 1, St. Boniface 1, St. James 1.

German Measles: Total 28—Unorganized 23, Roland 4, Kildonan East 1.

Whooping Cough: Total 18—St. Boniface 7, Winnipeg 5, St. James 4, Tuxedo 2.

Erysipelas: Total 17—Winnipeg 10, Brandon 1, Brooklands 1, Dauphin Town 1, Grandview Rural 1, Kildonan West 1, St. Vital 1, Whitemouth 1.

Diphtheria: Total 11—Winnipeg 11.

Anterior Poliomyelitis: Total 5—Turtle Mountain 2, Roland 1, Rosedale 1, St. Boniface 1.

Cerebrospinal Meningitis: Total 2—Whitemouth 1, Winnipeg 1.

Trachoma: Total 2—Morris Rural 1, Tache 1.

Diphtheria Carriers: Total 2—Winnipeg 1, Portage City 1.

Typhoid Fever: Total 1—Hanover 1.

Venereal Disease: Total 116—Gonorrhoea 84, Syphilis 32.

DEATHS FROM ALL CAUSES IN MANITOBA

For the Month of December, 1936.

URBAN—Cancer 45, Pneumonia 16, Tuberculosis 5, Syphilis 2, Diphtheria 1, Infantile Paralysis 1, Influenza 1, Paratyphoid Fever 1, all others under one year 2, all others 147, Stillbirths 11. Total 232.

RURAL—Pneumonia 36, Cancer 31, Tuberculosis 13, Influenza 9, Puerperal Septicaemia 2, Diphtheria 1, Infantile Paralysis 1, Measles 1, Mumps 1, Whooping Cough 1, Erysipelas 1, all others under 1 year 4, all others 173, Stillbirths 13. Total 287.

INDIAN—Tuberculosis 10, Pneumonia 5, Measles 1, all others under 1 year 1, all others 9, Stillbirths 1. Total 27.

VITAMIN ADVERTISING AND THE MEAD JOHNSON POLICY

The present spectacle of vitamin advertising running riot in newspapers and magazines and via radio emphasizes the importance of the physician as a controlling agent in the use of vitamin products.

Mead Johnson & Company feel that vitamin therapy, like infant feeding, should be in the hands of the medical profession, and consequently refrain from exploiting vitamins to the public.

—Advt.

Medical Library University of Manitoba

A summary of the contents of some of the journals available for practitioners, submitted by the Faculty of Medicine of the University of Manitoba. Compiled by T. E. Holland, B.Sc., M.D. (Man.), F.R.C.S. (Edin.).

"The Clinical Journal"—February, 1937.

"The Surgical Significance of Vomiting"—by R. J. McNeill Love, M.S., Lond., F.R.C.S. (Eng.).

"Prolapse of the Uterus"—by H. J. McCurrich, M.S., F.R.C.S., M.C.O.G.

"Stammering: Some Facts and Theories"—by H. St. John Ramsey, M.A., Speech Therapist and Lecturer in Speech, Guy's Hospital.

"Breathlessness"—by C. Gaultier Magee, M.R.C.P. (Ed.), D.P.H.

"The New England Journal of Medicine"— January 28th, 1937.

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—Advt.

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Clinical Section

Hyperparathyroidism

By

A. C. ABBOTT, B.A., M.D., C.M. (Man.),

F.R.C.S. (Edin.), F.R.C.S. (C.),

Lecturer in Surgery, University of Manitoba.

Introduction. The parathyroids are the smallest of all the ductless glands. Up until ten years ago no great general interest was shown in these tiny organs except by the surgeon who knew that to remove them entirely in the process of thyroidectomy produced the dreaded complication of tetany in a few hours or days. At that time his interest was in learning how to avoid them. However, as early as 1905, McCallum recorded the co-existence of a tumor of the parathyroid bodies and pathological changes in the kidneys. Askanazy in 1904 believed there was some relationship between the parathyroid glands and the decalcification of the skeleton in Osteitis Fibrosa. Erdheim noted their enlargement in association with osteomalacia in 1907. However, it was not until Mandel in 1925 removed a parathyroid adenoma from a case of osteitis fibrosa cystica with startling clinical improvement that the primary significance of tumors of the parathyroid bodies became generally recognized.

In the decade which has passed since Mandel made this discovery, a great deal of progress has been made and a great deal of the credit must be given to the biochemists. By their work our knowledge of the function of the parathyroid bodies has now provided an explanation, based on the known disturbance of mineral metabolism which accompanies parathyroid dysfunction, to account for the bony changes, kidney lesion, blood changes, etc., so commonly seen in hyperparathyroidism. This disease, originally a matter of interest to pathologists, has now also become a concern of the internist, the general surgeon, the orthopedist, and the urologist.

Hyperparathyroidism is a rare disease and, according to Wilder and Howell in a recent publication from the Mayo Clinic, it is probably a regional disease as is thyroid disease. At the Mayo Clinic only five proven cases have been found out of the 135 proven cases reported in the literature. Barr, of St. Louis, who reported the first cases in the United States together with his associates have found only four proven cases. Wilder and Howell have prepared a graph showing the relative incidence of hyperparathyroidism worked out on a percentage basis per 100,000,000 people. Forty-one cases came from the North Atlantic States, 21 from England and Scotland, 21 from the Upper Mississippi Valley, 9 from France and 4 from Italy. These 135 cases fulfil certain minimal criteria which are: (1) that

the report of the case has appeared in the literature; (2) that the description of the skeletal abnormality present be consistent with that of generalized osteitis fibrosa cystica, or in the absence of skeletal abnormality, that indisputable abnormality of calcium metabolism, characteristic of hyperparathyroidism, has been demonstrated by the study of the blood or urine; and (3) that a tumorous enlargement, either adenoma of one or more parathyroid glands, or diffuse hypertrophy and hyperplasia of the entire parathyroid apparatus, has been found either by operation or by necropsy. Their experience leads them to believe that cases which do not meet these criteria, with very few exceptions, are not cases of this disease.

Hyperparathyroidism is more common in females than males. Of the 135 proven cases reported by Wilder and Howell, 31 were males, 99 females, and in five no sex was mentioned. The ages ranged from 13 to 74 but the disease is more common in the fourth and fifth decade.

Hyperparathyroidism is a disease with many symptoms depending in great measure on the severity of the disease and the stage at which it is recognized. It is a disease which smoulders for years, crippling but not killing. For the sake of brevity the symptoms may be divided into three types, depending on the cause: (a) those due to hypercalcemia per se; (b) those related to skeletal changes; and (c) those due to the increase of calcium and phosphorus in the urine.

1. *Symptoms Due to Hypercalcemia.* In contrast to the increased excitability of the nerve muscle apparatus in hypocalcemia we find a marked decrease of excitability of the nerve muscle apparatus in hypercalcemia, hypotonia, lack of energy and will to do things, constipation and flat foot are common symptoms. Loss of appetite and loss of weight are marked in many cases.

2. *Symptoms Due to Skeletal Changes.* In some cases these may be entirely absent. In other patients there may be bone tenderness present for years and diagnosed as neuritis or arthritis. Spontaneous fractures may occur and in the more severe type the bony deformities may be so extensive as to make the patient bedridden.

3. *Symptoms Due to Hypercalcinuria and Hyperphosphaturia.* Polyuria and polydipsia are the most common symptoms cited but curiously were not present in the case I wish to report. Renal colic may be the first symptom noted and in my case ushered in the attack as far as the patient was concerned.

Diagnosis. The diagnosis of hyperparathyroidism when associated with the classical bone changes found in osteitis fibrosa cystica is a matter of comparative ease. It must be remembered, however, that this is only one particular type of hyperparathyroidism and really represents a late

stage of the disease in which bony changes predominate. Albright classifies hyperparathyroidism into six clinical types as follows:

1. *Classical Hyperparathyroidism* (Von Recklinghausen's Disease)—Bony changes predominate and consist of decalcification, cysts, tumors, and eventually fractures.

2. *Osteo-Porotic Form* — Symptoms due to generalized decalcification. There are no cysts or tumors.

3. *Hyperparathyroidism with Nephrolithiasis*—Symptoms may be merely referred to the urinary tract with no definite associated skeletal lesions.

4. *Hyperparathyroidism with Renal Insufficiency*—(Nephrocalcinosis). The symptoms resemble Bright's Disease.

5. *Acute Parathyroid Poisoning*—This simulates acute poisoning in dogs and may terminate rapidly.

6. *Hyperparathyroidism simulating Paget's Disease* (Questionable).

Pathology. The majority of the cases of hyperparathyroidism reported have been found to be due to a functioning adenoma. A few cases have been found, however, in which the pathological lesion has been one of generalized hyperplasia, a most disturbing factor to the surgeon.

Hyperplasia of the parathyroid can apparently be of two varieties. In the first, which is physiological, there is an increased need of hormone as in calcium privation, pregnancy, rickets, osteomalacia and probably long-standing renal insufficiency. This compensatory hyperplasia is apparently necessary to maintain a normal calcium level. In the second some outside factor drives the parathyroid to produce more hormone than is necessary. The pituitary is under suspicion as the causal factor in these cases.

In the present state of our knowledge, there is no way in which adenomas and hyperplasias can be distinguished pre-operatively. As a result of the increased production of hormone, there is a disturbance in the metabolism of calcium and phosphorous. As a rule this results in an increase in serum calcium level, a decrease in serum phosphate and an increase in both elements in the urine. This is not absolute, however, as will be shown later in discussing cases in which renal failure is well advanced.

It might be of interest to make a few remarks at this point concerning serum calcium, serum phosphate, and phosphatase estimation here.

The normal serum calcium varies from 9.0-11 mgms. per 100 ccs. Serum phosphate varies between 3 and 4.5 mgms. per 100 ccs. Normal phosphatase is 2-4 units. A rough outline of the values of serum calcium and phosphate in various diseases is as follows:

1. Hyperparathyroidism is a lesion unique in giving a high calcium and a low phosphate estima-

tion. This is not always true, however, as in cases with advanced kidney disease the calcium may be low or subnormal and the phosphates high.

2. Multiple Myeloma—high calcium; high or normal phosphates; normal phosphatase.

3. Metastatic Carcinoma—high calcium; high or normal phosphates; low to very high phosphatase.

4. Rickets—normal calcium; low phosphorous; phosphatase very high.

5. Osteomalacia—normal calcium; low phosphorous; phosphatase moderately high.

6. Senile Osteoporosis—calcium normal; phosphorous normal or low.

7. Paget's — calcium normal; phosphorous normal; phosphatase high.

Phosphatase estimation is not important as it probably is an index of osteoblastic activity and is dependent on amount of bone disease present and independent of degree of hyperparathyroidism.

In hyperthyroidism a small piece of hyperplastic gland can produce profound symptoms of thyrotoxicosis. This is not true of hyperparathyroidism, as 1 gm. of tissue will only produce so much hormone. This is of great importance to the surgeon as he knows that he must find a well developed tumor in a well advanced case to account for the symptoms.

Skeleton. One must not be discouraged from making a diagnosis of hyperparathyroidism because of the absence of bony changes. Two observers, Burney and Mintz, have found that the average appearance time of bony lesions is about the 8.6 years, whereas stones appear in about 3.2 years. One must remember that in hyperparathyroidism the demineralization is generalized and that you have no normal bone in the body to use as a comparison. The decalcification is there but it is relative. Histologically there is evidence of calcium absorption by an increase of the osteoclasts derived from the reticular cells of the bone marrow, with resulting fibrosis. This may account for our next pathological factor.

Blood Change. In the case reported, we found a profound anemia. This occurs in some cases of hyperparathyroidism and is due to the replacement of a great deal of the marrow cavity with fibrous tissue leading to a decrease in the blood forming elements and hence an anemia more or less profound. It would appear as if liver therapy was of some value pre-operatively, judging from our results. I can find no mention of its use in the literature.

Teeth. Curiously enough the teeth show no evidence of decalcification in hyperparathyroidism.

Urinary Tract. It is now well known that in hyperparathyroidism kidney lesions occur in a large per cent of cases. Barney recently reported 29 cases of hyperparathyroidism operated on, with 68.9% having kidney involvement.

Albright and his associates have arbitrarily divided the renal lesions of hyperparathyroidism into three classes:

1. Stones in kidney pelvis associated with secondary pyelonephritis.
 2. Deposits of calcium in the renal parenchyma (renal calcinosis).
 3. Acute parathyroid poisoning with anuria.
- In review of 83 cases of hyperparathyroidism they found the following kidney lesions:
- | | | |
|----------|--------------------------|----------|
| 23 cases | Type I Pelvic Stone |27% |
| 19 cases | Type II Renal Calcinosis |23% |
| 1 case | Type III | |

Some very interesting statistics were published this year by Barney from the Massachusetts General Hospital, covering the years 1933-34-35.

1. Number of urinary tract stones—340.
2. Number of these with hyperparathyroidism—12=4.6%.
3. Parathyroid tumors—29.
 - I. Associated calculi 20; K. & U. 19, Bladder 1 68.9%
 - II. Renal calcification 4=13.9%
 - III. Skeletal lesions 5=17.2%
 - IV. Renal lesions only 13=44%
 - V. Skeletal and renal lesions 11=37.9%

No recurrences.

Hunter, on the other hand, in 1930, reporting 32 cases, found stones present in 31.2%.

No one has, up to the present time, satisfactorily explained why, in some cases, we find calcium and phosphates deposited in the kidney pelvis in the form of stones, while in other kidneys we get deposits in the parenchyma and collecting tubules. Mandel has recently shown that in guinea pigs with increased serum calcium, obstruction of the ureter produces stones in pelvis.

One must not be misled by a normal serum calcium and serum phosphate. It has been shown conclusively that hyperparathyroidism can be present with a normal serum calcium and a normal or raised serum phosphate if a long standing severe nephritis be present. There is considerable undisputable evidence to be found in the literature to show that the kidney lesion in some cases is primary and the hyperparathyroidism secondary.

X-Rays. The x-ray in many cases leads one to suspect hyperparathyroidism. The changes seen are increased radiability, deformities, cysts and fractures. Only one is fundamental and that the increased radiability. Hyperparathyroidism being a metabolic disturbance, must exert its fundamental action, demineralization, on the entire skeleton if at all. Occasionally one sees reabsorption of the terminal phalanges.

Having made the diagnosis, how are we to treat these cases.

NON-SURGICAL TREATMENT

1. **X-ray.** Albright and his associates treated four cases with maximum doses of x-ray to the neck region and found no amelioration in symptoms, no changes in blood or urinary chemistry, and no histological change in the tumor removed surgically at a later date.

One observer, however, reports a good result in one case with radiation.

2. **Dietary.** Albright and his associates found that a high phosphate, or a high calcium diet or preferably both improved the bone condition but, unfortunately, precipitated kidney lesions. They also found vitamin D of no value.

Here again we find as in so many diseases, the physician is forced to turn the sufferer over to the surgeon for cure. Before embarking on the surgical treatment, however, one must refresh one's knowledge concerning the embryology and anatomy of these small organs.

Embryology. The parathyroids arise from the endoderm of the third and fourth branchial clefts, in close connection with the anlage of the thymus gland.

The superior parathyroid arises from the fourth branchial cleft; the inferior parathyroid arising from the third. The inferior parathyroid arises embryologically higher than the superior parathyroid but in the caudal migration of the branchial derivatives, it outstrips the parathyroid arising from the fourth cleft and also the thyroid. It is closely related to the thymus. This is of surgical importance as it may be found buried in the thymus, and this may also be an explanation as to why some parathyroids are found inside the chest.

Anatomy. These tiny little structures are usually four in number, oval or pyriform in shape, about 6 mm. long, 3-4 mm. wide and 2-3 mm. thick. Their position is very variable and it would appear as if their position varies more in the minds of the surgeon than in the human body.

Shelling states: "The superior parathyroids are fairly constant in position on the medial aspect of the dorsal surface of each lobe of the thyroid at about the junction of the upper $\frac{1}{3}$ and lower $\frac{2}{3}$. In man they are embedded in the thyroid substance and are separated from it by a connective tissue capsule."

Labey states: "The superior parathyroids are found on the posterior aspect of the upper pole where this structure rests against the larynx. We have also found them on the front of the thyroid, on the lateral margin, in cellular tissue separated from the thyroid in which position it receives a separate branch from the inferior thyroid artery, on the lower pole of the thyroid, the lower margin of the isthmus of the thyroid, in the groove between the trachea and oesophagus, behind the oesophagus, and finally buried in the thyroid itself.

Hermann, in a recent publication, states that they are found on the posterior surface of the upper $\frac{1}{3}$ of the thyroid in close relationship to the superior thyroid artery, from which their blood supply is derived; that their nerve supply is from the superior laryngeal nerve; and that they are always found anterior to the pretracheal fascia.

The inferior parathyroid is more variable. The blood supply is derived from the inferior thyroid artery and the nerve supply arises from the recurrent laryngeal nerve. The course of the recurrent laryngeal nerve and the inferior thyroid artery vary considerably but they always cross and it is at this point that the tiny artery and nerve join up and form the stalk to the inferior parathyroid gland. In 34 out of 44 dissections Hermann found the gland in the inverted V angle formed by the inferior thyroid artery and recurrent laryngeal nerve. They usually are in front of the pretracheal fascia. McGregor, however, points out that they may lie above the inferior thyroid and in this case may be deep to the pretracheal fascia requiring incision to find. Our other point is worth-while remembering. Frequently these little bodies can only be distinguished from lymph nodes, thyroid nodules, fatty nodules, by the microscope, and the inferior parathyroid is frequently found wrapped up in a layer of fat.

Pre-operative Considerations. In a large percentage of cases tetany follows removal of an adenoma. Wilder and Howell postulate that when an adenoma develops in a parathyroid gland, the normal parathyroid ceases to function. Sudden removal produces tetany due to a temporary lack of function of the normal parathyroid bodies. This is only theory and not proven fact. The administration of vitamin D might offset the tetany, as it increases absorption of calcium and throws up a barrier to prevent its loss by bowel. The pre-operative treatment of anemia has already been mentioned.

Stone or Tumor. Generally speaking, the procedure of choice is to remove the tumor first in cases of hyperparathyroidism complicated by kidney stone. The stone can be left until a more opportune time, when the patient has improved in health. It is conceivable that a new stone may form before the tumor is removed in cases treated by removal of the stone first.

Operation. The best type of anaesthesia is open ether as it produces the least venous oozing. The usual thyroid incision is made and the thyroid gland exposed and mobilized with absolute haemostasis. Silk sutures inserted into the thyroid gland with a non-cutting curved needle is the best type of retractor. The search for the tumor must be systematic and thorough. If a tumor is located, look for further tumors or normal glands. At this stage it is wise to remove a biopsy for rapid section. The roll of the pathologist is most important at this stage as the surgeon must rely on his ability to state whether

the biopsy is from a normal parathyroid, an adenoma, or a hyperplastic gland. A word with regard to the histology of the parathyroid will be of value here.

Normal Histology.

Cells may be in solid masses or follicles. Follicular formation increases with age.

Three types of cells:

Chief cells—most numerous. Have clear cytoplasm and large nucleus.

Oxyphil cells—much larger than chief cells. Protoplasm granular and stains intensely with acid dye. The nuclei are relatively small.

Small dark cells—granular protoplasm and small nucleus. The gland is normally honeycombed with fat.

Adenoma.

1. Hyperchromatic chief cells larger than normal chief cells usually in columnar, glandular, or pseudo-glandular formation.

2. Wasserheller Zellen cells—huge cells with sharp membranes, cytoplasm water clear. Usually arranged in masses with no alveolar arrangement.

3. Some oxyphil cells.

4. Decrease in fat.

Hyperplasia.

1. All Wasserheller Zellen cells with tendency to glandular formation.

2. No fat cells.

3. No oxyphil or chief cells.

Their characteristic is homogeneity of structure, size of cell, clearness of cytoplasm, and tendency to glandular formation.

In a well-established case of hyperparathyroidism, if you fail to find a tumor, do not remove normal glands. It will be of no benefit to the patient, and increases the danger of tetany if a tumor is found later on at a second operation.

Resection of thyroid in blind hope of removing an intra-thyroid parathyroid is rarely justifiable. Occasionally it may be done at the end of a very extensive search.

If no tumor is found and hyperparathyroidism persists—check diagnosis by a bone biopsy from sternum. If this is positive, explore mediastinum.

In secondary operations or in severe cases with a great deal of bone involvement, it might be wise to do a subtotal resection of an adenoma.

Multiple Tumors.

Subtotal Resection—it may be analogous to hyperplastic goitre.

Post-operative Care.

1. Blood transfusion if anaemic.

2. High calcium diet.

3. Administration of calcium gluconate and Vitamin D.

4. Parathormone.

Results:—

1. Serum calcium and phosphorous return to normal rapidly. Severe cases—bone lesions—slow return.
2. General symptoms improve rapidly.
3. Muscle and bone tenderness is promptly relieved.
4. Demineralization slowly replaced.
5. Bony tumors may disappear.
6. Bone cysts remain.
7. Kidney repair—unknown.
8. Stones probably remain.
9. No recurrences of symptoms.

CASE REPORT

November 20, 1933. N. A. H. W., Age 58.

I first saw this man on November 20, 1933, at his home, suffering from an excruciating pain in the left loin, referred to the left groin and testicle. There was profuse haematuria. Examination of the patient revealed normal temperature and pulse, B.P. 138/76, heart and lungs normal, marked tenderness in the left loin associated with muscle spasm in the loin and left iliac fossa. Rectal examination negative. Weight 176 pounds. Diagnosis—stone in left ureter.

The pain in this case was so severe that it was practically uncontrollable with ordinary doses of Morphine. From the first, we had difficulty in getting a bowel movement and on the fifth day he was removed to the Winnipeg General Hospital with a diagnosis of paralytic ileus. Dr. Neil John McLean saw him with me in consultation. Three enemas were given, supplemented with Pituitrin, with absolutely no effect. A barium enema passed to the ileocaecal function with ease. There was a suggestion of a narrow area in the sigmoid.

It was decided to cystoscope him under spinal anaesthesia in the hope of relieving the ileus and at the same time to endeavor to remove the stone.

In the operating room 150 mgms. of Spinoecaine were given with almost instant copious bowel movement, the first and the only ileus I have seen relieved by a spinal anaesthetic. A large bougie was passed up the ureter, followed by four catheters which were left in for 24 hours, twisted and removed with no stone. The pain gradually subsided.

On December 3, 1933, the ureter was re-dilated and kidney function tests at that time showed dye excreted from both sides, grade four in five minutes on a scale of four. X-rays showed a stone in the left ureter 2" above the pelvic brim.

The patient was kept under observation and his ureter was dilated occasionally until July, 1935, when he decided to have the stone removed surgically.

He was re-admitted to the Winnipeg General Hospital. A cystoscopic examination was done to re-check the kidney function. Dye appeared

from the right kidney in grade four concentration in four minutes and from the left it appeared to trickle in a small stream in grade one concentration in four minutes. A catheter could not be passed up the ureter, indicating almost complete obstruction.

August 3, 1935. Stone removed from the left ureter through a left rectus incision, the ureter was not sutured and an extra peritoneal penrose drain left in. Post-operative convalescence was complicated by vomiting for the first week, otherwise being normal. Urine came from his wound for two weeks.

I did not see this patient again until September 10th, when I returned from my holidays. His appearance was rather shocking. He had failed very rapidly, his face being white and drawn, his weight was down to 140 pounds, and he was having considerable pain in his right kidney. He was very lethargic, extremely weak, ached all over and apparently did not care what went on. His mental attitude to all things had changed. He was in no way interested in all the things that had been a part of his previous daily life, his voice was weak and soft, and he was obviously anemic. I at this time suspected hyperparathyroidism.

He was re-admitted to the Winnipeg General Hospital on September 25, 1935, and fully re-investigated as follows:

Cystoscopic Examination: — Bladder normal. Prostate—right, left, and middle lobes enlarged, grade one. Small cleft anteriorly. Indigo-carmin given intravenously appeared from both ureters in six minutes, grade four. The left ureter was dilated with ease.

Urinalysis:—Alkaline, cloudy, specific gravity 1016, 30 pus cells per H.P.F.

Blood Count:—R.B.C. 2,920,000. W.B.C. 9150. Differential count—polymorphs 55, lymphocytes 41, monoculears 1, eosinophils 3. Haemoglobin 55. C.I. 95.

Serum Calcium:—12.8 mgms. per 100 ccs. Phosphates 2.4 mgms. per 100 ccs. Phosphatase 6.5 units (King's method).

Barium Series:—Entirely negative.

Gall Bladder Visualization:—The gall bladder was only faintly visualized, indicating the possibility of some pathology.

Chest Examination:—Normal.

X-ray of Spine and Bones:—There was definite lipping of the margins of several dorsal vertebrae but no definite changes in the spine or other bones to suggest parathyroid tumor.

Stool Examination:—Negative.

October 2, 1935. Under spinal anaesthetic the right kidney was exposed and found to be very adherent. We were unable to deliver it or expose the pelvis properly and a stone about 1 cm. in diameter was removed through the cortex from

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the pelvis. Transfusion of 500 ccs. of blood was given immediately afterwards by the direct method. This raised his red blood count 200,000. The patient made an uneventful recovery and was sent home to recuperate and be prepared for an exploration for a parathyroid tumor.

From the time of his kidney operation the patient ran a temperature of from 100 to 102 persistently. In consultation with Dr. J. D. Adamson it was decided to endeavor to improve his blood condition. He was put on Ferrosyn, gr.X, T.I.D., and 100 grams of liver, intramuscularly, bi-weekly. By October 29, 1935, his red cell count had risen to 3,370,000, haemoglobin 63%, and white blood cells to 11,100. On November 5th, the red blood cells were 4,120,000, haemoglobin 68%, and white blood cells 12,950. On October 22nd, his wound in the right loin broke down and discharged urine and this sinus persisted. At the same time he developed a sharp pain in the right iliac fossa and we suspected the formation of another ureteral stone. X-rays were negative, however. He was still losing weight.

He was re-admitted to the Winnipeg General Hospital on November 12. Weight 132 pounds. Serum calcium 13.7, and serum phosphates 2.0. Irradiated Ergosterol, M 1, B.I.D. was given preoperatively.

November 18, 1935. Operation. Ether anaesthesia. The thyroid gland was exposed by the usual transverse incision, the sternohyoid and sternothyroid muscles being divided. Sharp dissection and absolute haemostasis was maintained throughout the operation. In no operation is a bloodless field more necessary. A silk ligature was stitched through and through each lobe as a retractor. The posterior aspect of the right lobe was first exposed and no tumor found. The superior parathyroid was seen lying on the surface of the gland but was normal in size.

The left lobe was rolled out and immediately a tumor was seen in the middle third of the posterior surface about 2 cm. long, 1 cm. wide, and 1/2 cm. thick. This was carefully removed and a rapid section done to find out whether it was an adenoma or a diffuse hyperplasia. The report was adenoma. In spite of this a careful search behind the trachea and oesophagus was made and also the upper portion of the thorax explored for further tumors without success. The neck was closed in routine fashion and the patient was given a blood transfusion.

November 19, 1935. Patient in excellent condition. The wound in the loin ceased discharging.

November 20, 1935. Masculine voice returned and the patient was found sitting up in bed telling the nurse funny stories. His whole mental outlook was back to normal. Serum calcium 10.4, phosphates 4.6.

November 22, 1935. Serum calcium 10.1, phosphates 3.0.

November 23, 1935. Weight 134 pounds.

December 11, 1935. Weight 139 pounds.

November 18, 1936. One year following operation we re-checked the patient. His weight was 178 pounds, serum calcium 9.5, and serum phosphate 2.5; R.B.C. 4,950,000, W.B.C. 9,600, haemoglobin 93%. The patient has been back at full duty for two months and is in excellent health.

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